U.S.ARMY

U.S. AIR FORCE

9/18/18

JOINT BASE LEWIS-McCHORD
SERVICE MEMBERS DEFENDING AMERICA

Joint Base Lewis-McChord

"We are a Joint Force Power Projection Platform."

Trust and Transparency - Collaboration - Collective Responsibility

JBLM PFAS PA/SI

Technical Project Planning Meeting #3
September 18, 2018

Agenda

TPP Team Members Introductions

Overview

Meeting Objectives

Project Approach Review – Where Are We?

Source Area Identification Results

Phase 1 Sampling Results

Proposed Phase 2 Sampling Locations

Next steps

Current Schedule

Introductions

JBLM

Meseret Ghebresllassie - IRP Program Manager DPW Environmental Division IMLM-PWE

Jerome Lambiotte – IRP Technical Lead, DPW Environmental Division IMLM-PWE

Paul Steucke – Environmental Chief, DPW Environmental Division IMLM-PWE

Cynthia Trout – Water Purveyor, DPW Environmental Division IMLM-PWE

Army Environmental Command

Dave Mays

Martin Roberts

USACE

William Graney - Program Manager for Army & AF EQ and IRP Seattle District USACE

Jayson Osborne – Remedial Biologist

Bill Gardiner – Risk Toxicologist

Introductions

U.S. EPA Region X

Chris Cora – Project Manager

Ted Repasky – Hydrogeologist

Washington State Department of Ecology

Chuck Hoffman – Project Manager

Washington Department of Public Health

Steve Hulsman

Cheryl Howe

AECOM

Anthony Palmieri – Deputy, Project Manager/Geologist

Rosa Gwinn – Lead Verifier and Oversight

Greg Burgess – Project Manager

Overview

The Army's policy is to break identified pathways.

Five production wells currently have PFOS/PFOA concentrations above the EPA LHA concentration of 70 parts per trillion (ppt), range is 70 to 251 ppt.

These five wells have been taken off line. JBLM has a mitigation plan in place.

The remaining production wells are less than 70 ppt.

Under this project, Potential source areas have been identified.

Meeting Objectives

1. Where are we in the project approach
2. Review identified potential sources
3. Discuss Phase 1 sampling results
4. Discuss/Select proposed Phase 2 sampling locations
5. Review next steps

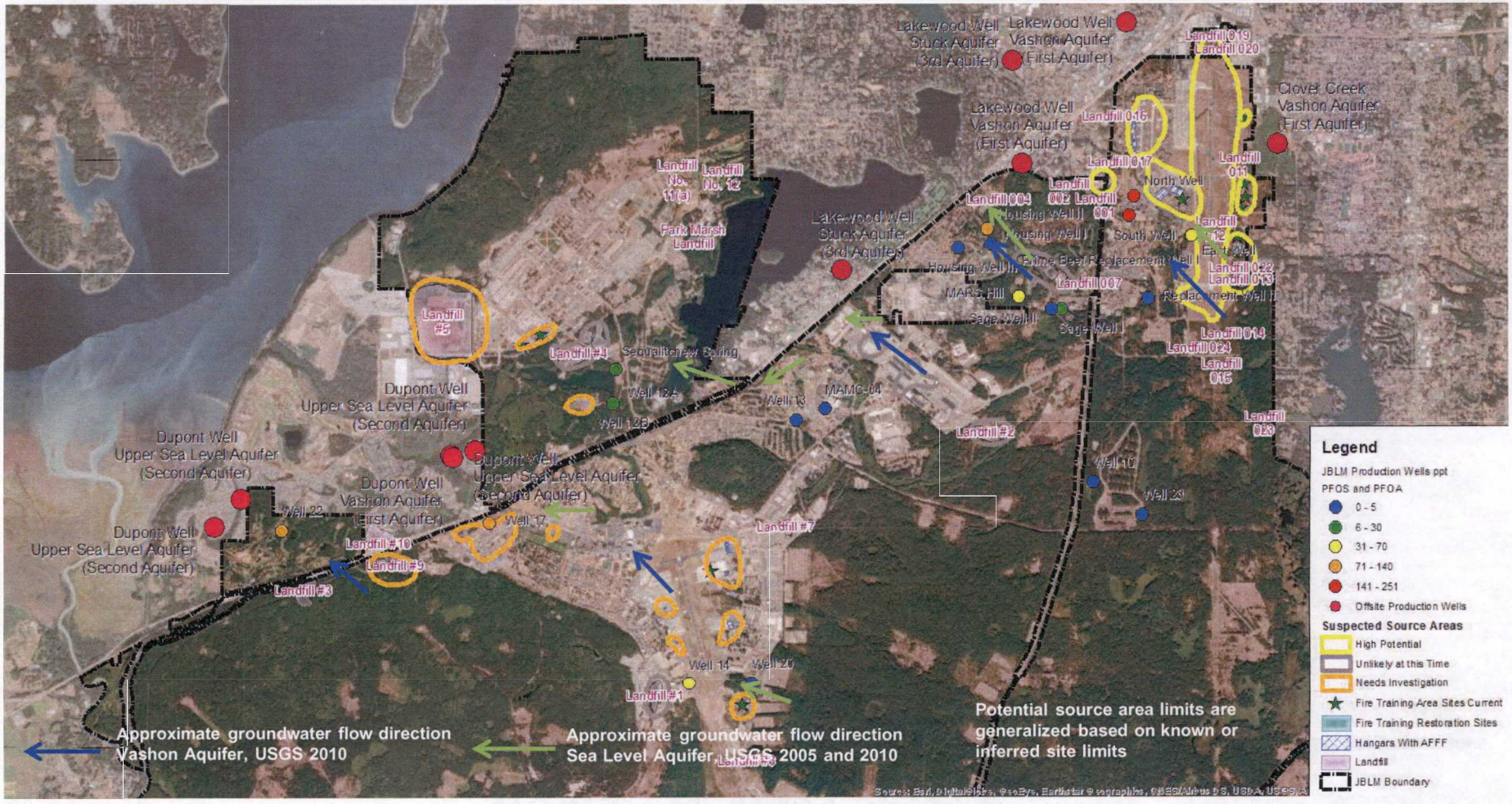
Project Approach Review – Where Are We?

1. Review existing data – complete
2. Conduct potential PFOS/PFOA source assessment/identification – Complete
3. Prioritize potential source areas - Complete
4. TPP #2 – Confirm Phase I well sampling locations – Complete
5. Project team QAPP review and finalization - Complete
6. Phase I sample collection and analysis - Complete
   a. Forty existing wells were sampled
   b. Surface water sampling at one location
7. Sampling recommendations from Second Installation Five-Year Review to support protectiveness statements - Complete
   a. OU2 Landfill 1 source area wells
   b. OU2 Landfill 4 source area wells
   c. OU3 ALGT source area wells
   d. Influent and effluent sample collection and analysis for
      i. OU 1 LF-2 Pump & Treat (P&T) System
      ii. OU 1 I-5 P&T System
      iii. OU 1 Sea Level Aquifer P&T System

Project Approach Review – Where Are We?

8. Driller water supply sampling to ensure it is PFAS free - Complete
9. Conduct lab analysis of water samples – Complete
10. Validate sample results – Complete
11. TPP #3 – Review summary of results – **We are here!**
    a. Identify supplemental well installation locations
    b. QAPP Addendum
        i. Tables
        ii. Maps with new well locations
        iii. Phase 1 data summary
12. Finalize QAPP Addendum
13. Conduct Phase II groundwater sample collection and analysis
14. TPP #4 – Review summary of results
15. Report all results with project team review prior to finalization

PA Potential Source Areas



Potential source areas identified in McChord Field Area

Potential source areas in Fort Lewis and North Fort Lewis need evaluation

Phase 1 data indicate ALGT-LF 5, LF 1, LF 2, and LF 4 are not potential source areas

Preliminary Phase 1 Sampling Results

EPA HAL is 70 ppt for sum of PFOS and PFOA only

QAPP Question

"Is the sum of the six UCMR-3 PFAS Compounds greater than or less than 70 ppt?"

- More conservancy in potential source identification
- More flexibility in evolving regulatory climate

From this point forward, results are sum of the six UCMR-3 compounds

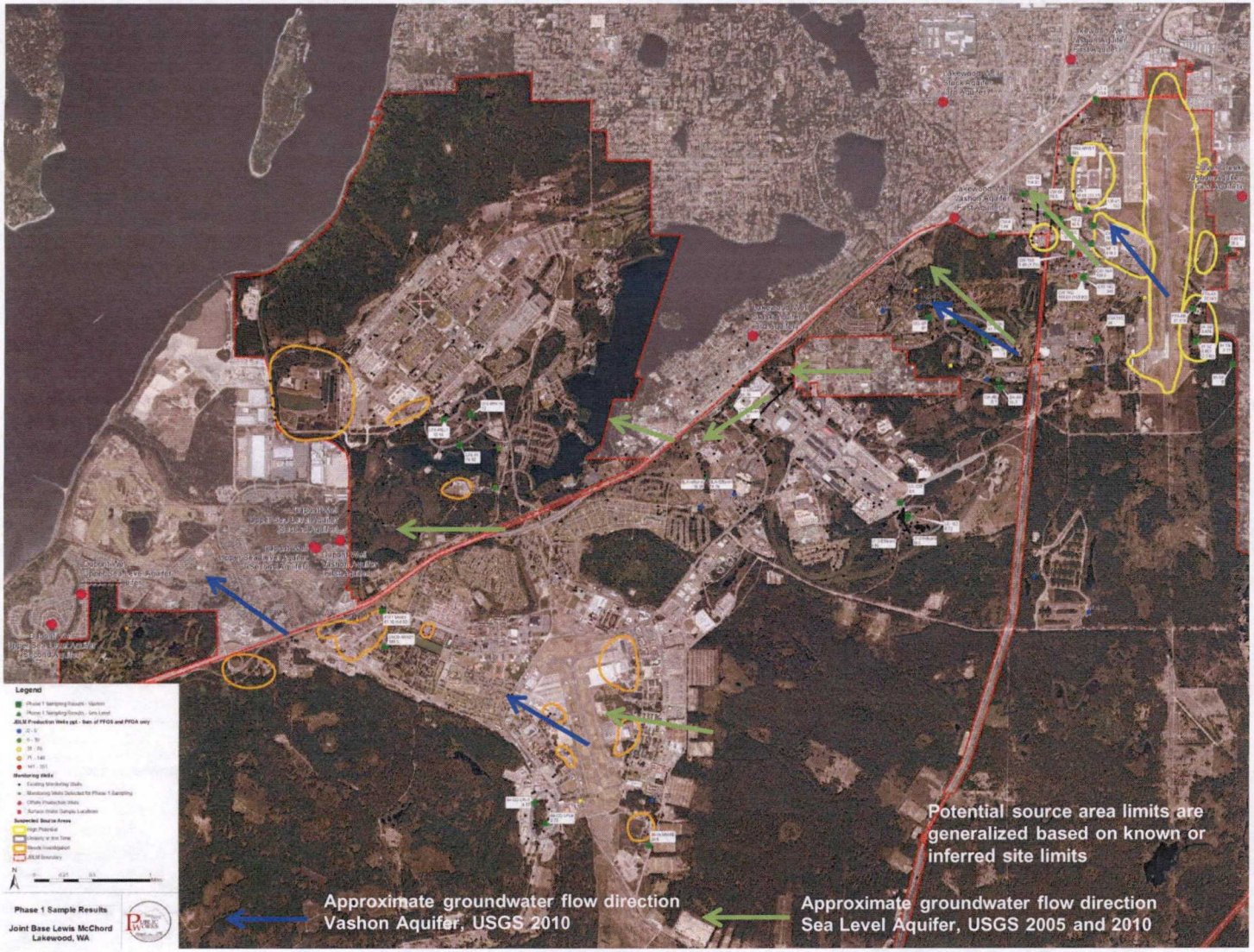
18 of 50 detections > 70 ppt

- All but one in McChord area, other in Western Fort Lewis

All six UCMR-3 compounds detected

Only one non-UCMR compound detected at a higher frequency

Preliminary Phase 1 Sampling Results Overview



Phase 1 Results
Sum of six UCMR-3 PFAS compounds from GW monitoring wells

Detections greater than 70 ppt for sum of six UCMR-3 PFAS compounds are in the McChord Area

One in American Lake Garden Tract

One location in western Fort Lewis near well 17

Zoom in slides to follow

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

Preliminary Phase 1 Sampling Results

McChord Field

Phase 1 Results
Sum of six UCMR-3 PFAS compounds

Detections > 70 ppt for sum of six UCMR-3 PFAS compounds are in the McChord Area

All but two samples from Vashon Aquifer

Two Sea Level Aquifer samples

One of two Sea Level Aquifer samples > 70 ppt

Surface water detection < 70 ppt

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2010

Preliminary Phase 1 Sampling Results

American Lakes Garden Tract

Phase 1 Results
Sum of six UCMR-3 PFAS compounds

Only one of eight Vashon Aquifer locations > 70 ppt

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

Preliminary Phase 1 Sampling Results

Log-Ram Area

Phase 1 Results
Sum of six UCMR-3 PFAS compounds

None of two Vashon Aquifer locations > 70 ppt

None of three treatment system influent samples > 70 ppt

None of three treatment system effluent samples > 70 ppt

Preliminary Phase 1 Sampling Results

South Gray Field (Landfill 1)

Phase 1 Results
Sum of six UCMR-3 PFAS compounds

None of three Vashon Aquifer locations > 70 ppt

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Preliminary Phase 1 Sampling Results

Western Fort Lewis

Phase 1 Results
Sum of six UCMR-3 PFAS compounds

One of two Vashon Aquifer locations > 70 ppt

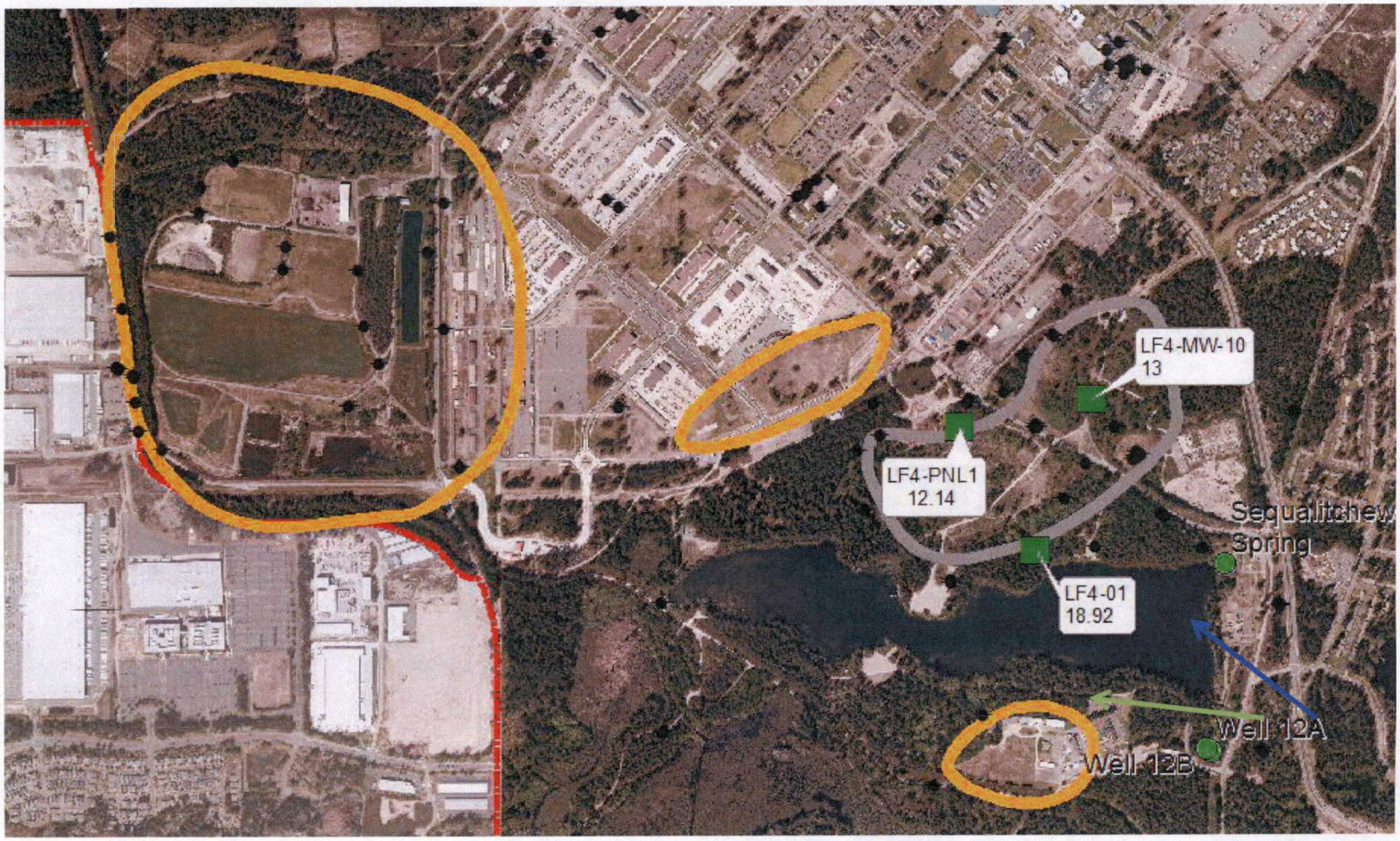
Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

Preliminary Phase 1 Sampling Results

North Fort Lewis (Landfill 4)



Phase 1 Results Sum of six UCMR-3 PFAS compounds

None of three Vashon Aquifer locations > 70 ppt

P-MPS 2000 gpd
PFAS/PFOA = 20 ppt

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Results in nanograms per liter (ng/L) or parts per trillion (ppt)

High Potential Source Areas

High Potential Source	
Specific Area	Generalized Area
McChord - Firefighting Training (FT) Area FT 032	McChord Field
McChord – Historic FT Areas	
McChord - Landfill 013	
McChord – Historic FT Area 033	
Fire Station #105	
Building J00006	
McChord - Hangars 3 and 4	
McChord – Historic Wash Rack /	
McChord - Hangar 5	
McChord - AFFF Sump between Hangars 5 and 6	
McChord - Hangar 6	
McChord - Hangar 7	
McChord - Hangar 9	
McChord - AFFF Sump between Hangars 9 and 10	
McChord - Hangar 10	
McChord Flight line Infield – 4 Aviation Fuel Tanks	
McChord - Hangar 13	
McChord - AFFF Sump West of Hangar 13	
McChord – Hangar 301	
McChord – Aircraft Accident Responses	
McChord Landfill 12	

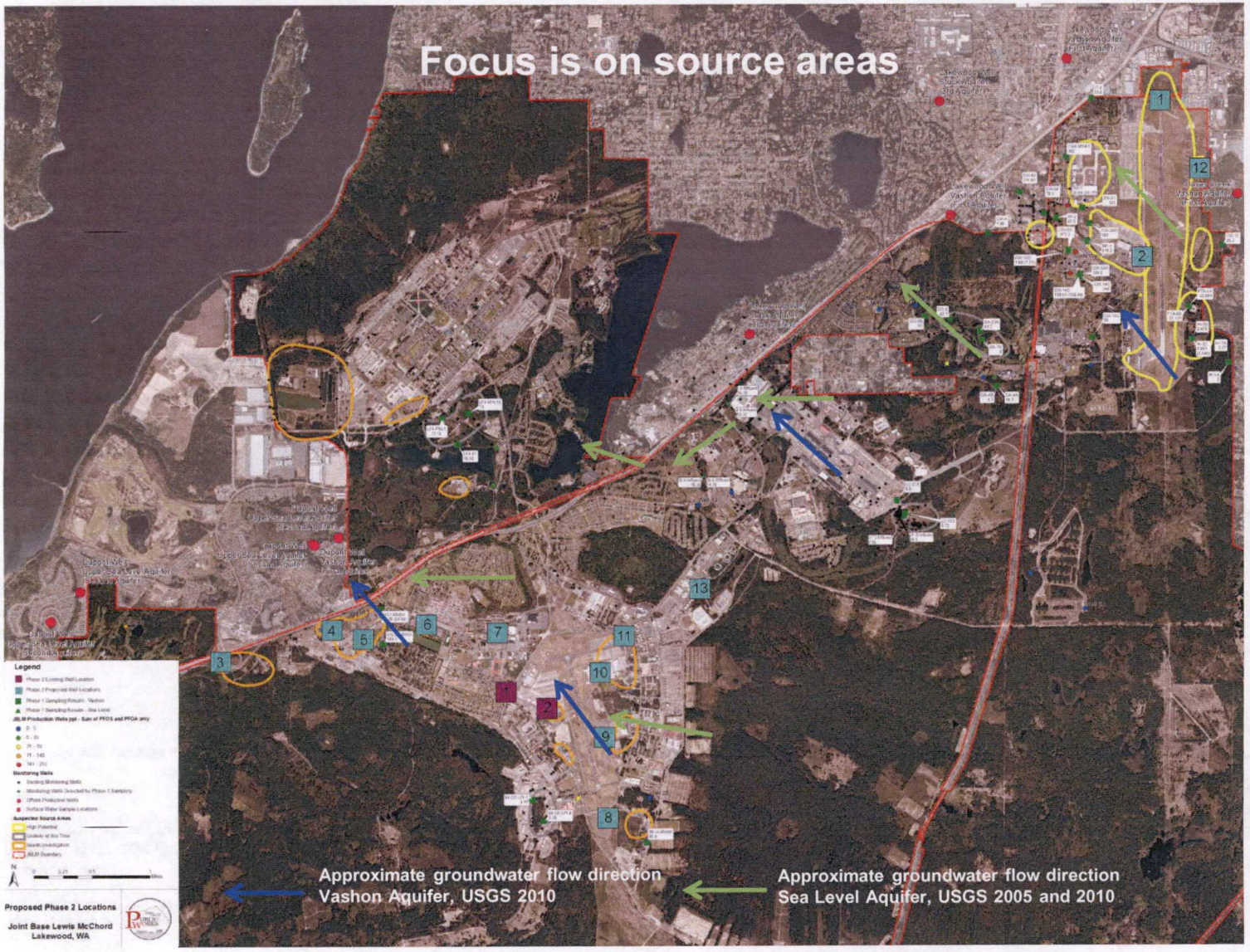
Areas Needing Additional Evaluation Gray Field

Needs Evaluation	
Specific Area	Generalized Area
Gray Field - Wash Rack	Gray Field
Gray Field – Hangar 3101	
Gray Field - FTLE-17	
Gray Field - Hangar 3146	
Gray Field - Army Reserve Hangar	
Gray Field – Storm water Drainage Swale near Hangar 3273	
Gray Field – Storm water Drainage Swale near Hangar 3146	
Gray Field – Hangar 3098	
Gray Field – Building 3095, AFFF system for Hangar 3098	
Gray Field – Building 3099	
Gray Field – Hangar 3063	
Gray Field - Fire Station 102 – Bldg 3081	
Ft. Lewis - Buildings 04074 & 04076	West Fort Lewis
Ft. Lewis - LF #9 (and #10)	
Ft. Lewis – Bldg 1401 -	
Ft. Lewis - Fire Station 1 – Bldg 4100	
Ft. Lewis - Fire Station 7 – Bldg 2014	
North Ft. Lewis - LF #5	
Ft Lewis Buildings 1206 / 1210 Ranges	
North Ft Lewis – AOCs 15-1 and 15-2	North Fort Lewis
North Ft. Lewis - Historic Solvent-Refined Coal Plant	
North Ft Lewis – Wash Rack	

Unlikely Potential Sources

Unlikely Potential Source at this time	
Specific Area	Generalized Area
Ft. Lewis Landfill 2	Lewis Main
McChord Field Main Bulk Fuel Tank Farm	
Ft. Lewis Logistics Center - Building 9612 current wash rack	
Ft. Lewis Logistics Center - Building 9636 - Bulk "Fuel spot"	
Ft. Lewis Logistics Center: Historic waterproofing	
Ft. Lewis Logistics Center: Historic laundry	
North Ft. Lewis - Landfill #4	
Landfill #1	
ALGT Landfill 005	

Proposed Phase 2 Source Area Sampling Locations Overview



1

Proposed new well location

1

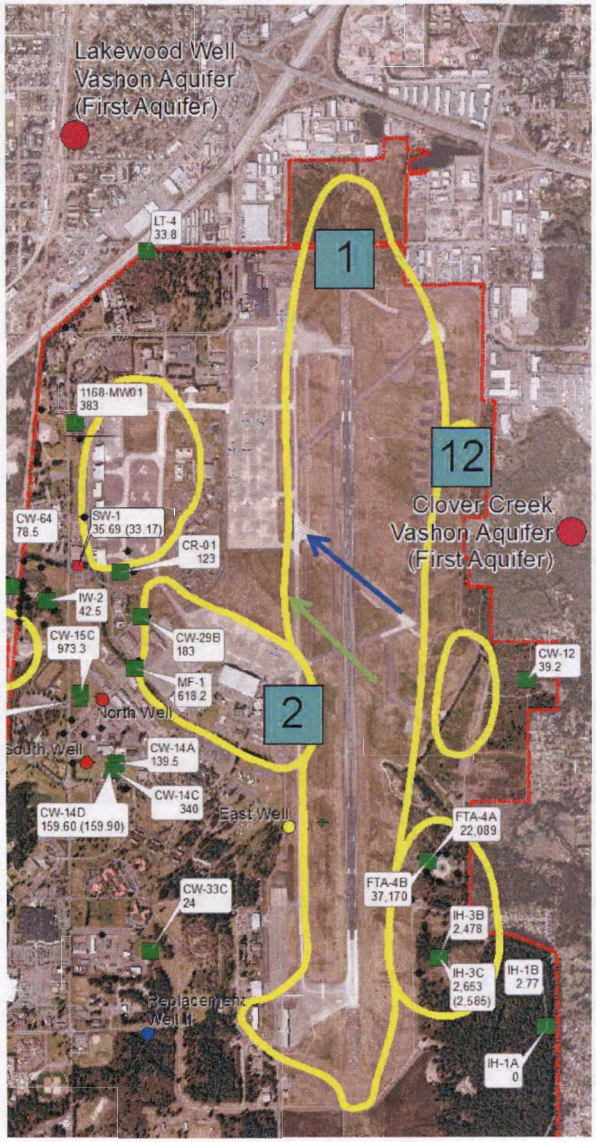
Proposed existing well location

Phase 2

Look at potential source areas that did not have sufficient existing well coverage

Following slides zoom into specific areas and show rationale

Proposed Phase 2 Source Area Sampling Locations



McChord Field

1

Proposed new well location

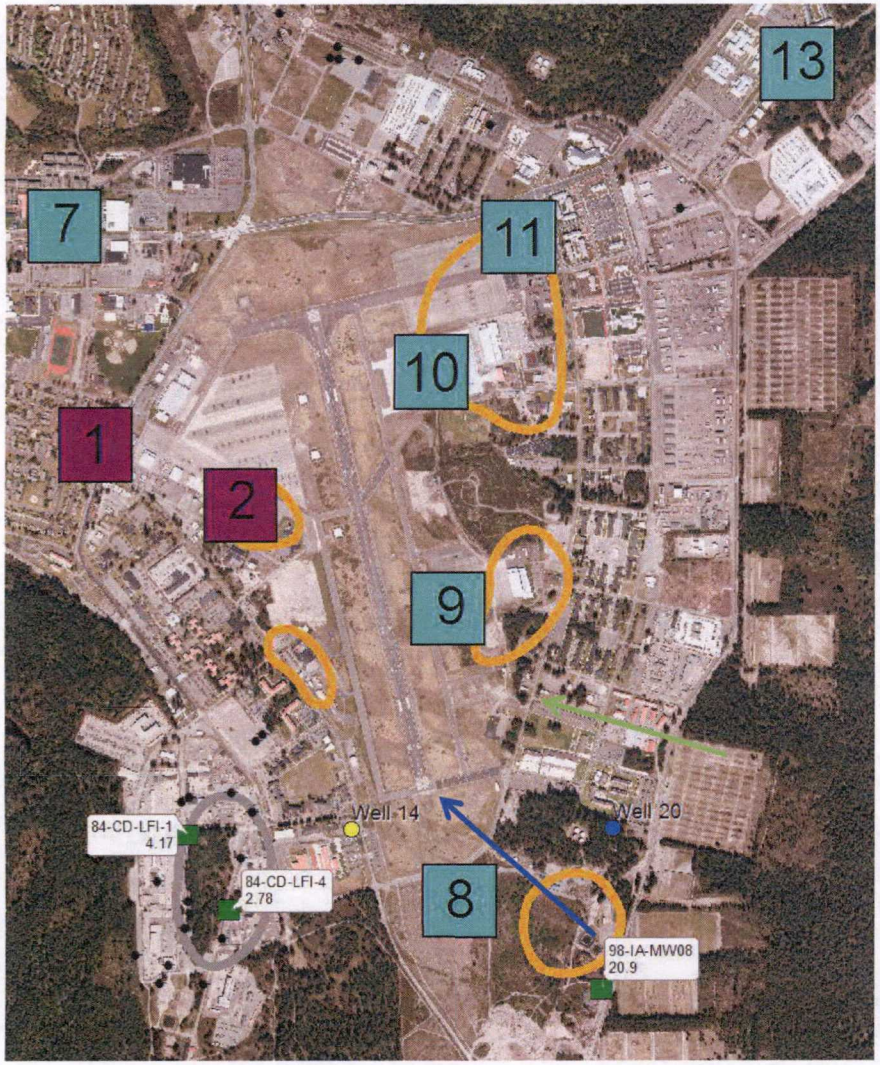
Location	Screen Interval (ft bgs)	Rationale	Nearest Potential Area of Concern	Nearest Production Well
Proposed New Well Installation Locations				
1	40-50	Assess for the presence of PFAS in shallow groundwater along JBLM boundary at the north end of McChord Field	North McChord Hangars and Runways	North Well
2	40-50	Assess for the presence of PFAS in shallow groundwater adjacent to FT033, McChord Field	North McChord Hangars and Runways	North Well
12	40 - 50	Assess for the presence of PFAS in shallow groundwater within former fire training area FT027, adjacent to the JBLM boundary	FT027 and Runways	North Well

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Proposed Phase 2 Source Area Sampling Locations

Gray Field



Location	Screen Interval (ft bgs)	Rationale	Nearest Potential Area of Concern	Nearest Production Well
Proposed New Well Installation Locations				
8	40-50	Assess for the presence of PFAS in shallow groundwater downgradient of SWMU 47 FTA and Washrack 6 and upgradient of Well 14	SWMU 47 and Washrack 6	Well 14
9	40-50	Assess for the presence of PFAS in shallow groundwater adjacent to Gray Field Hangar	Gray Field Hangars and Runways	Well 14
10	40-50	Assess for the presence of PFAS in shallow groundwater within former fire training area FTLE-17	Gray Field Hangars and Runways, FTLE-17	Well 14
11	40-50	Assess for the presence of PFAS in shallow groundwater adjacent to Gray Field ANG hangar	Gray Field Hangars and Runways	Well 14 and Well 17
13	40 - 50	Assess for the presence of PFAS in shallow groundwater upgradient of Gray Field	Gray Field Hangars	Well 17
Proposed Existing Wells To Be Sampled				
2 (03075-MW02)	20 - 35	Assess for the presence of PFAS in shallow groundwater downgradient of Gray Field	Gray Field Hangars	Well 17

8

Proposed new well location

2

Proposed existing well sampling location

Location 13 may be moved if suitable alternative exists

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Proposed Phase 2 Source Area Sampling Locations

Western Fort Lewis

Sampling Location/	Screen Interval (ft bgs)	Rationale	Nearest Potential Area of Concern	Nearest Production Well
Proposed New Well Installation Locations				
3	40-50	Assess for the presence of PFAS in shallow groundwater near Landfill 9	Landfill 9	Well 22
4	40-50	Assess for the presence of PFAS in shallow groundwater adjacent to historical laundry facility	Historical Water Proofing and Laundry Facilities	Well 17
5	40-50	Assess for the presence of PFAS in shallow groundwater adjacent to historical water proofing facility	Historical Water Proofing and Laundry Facilities	Well 17
6	40-50	Assess for the presence of PFAS in shallow groundwater near Firehouse and upgradient of Well 17	Firehouse	Well 17
7	40-50	Assess for the presence of PFAS in shallow groundwater downgradient of Gray Field and upgradient of Well 17	Gray Field Hangars and Runways	Well 17
Proposed Existing Wells To Be Sampled				
1 (JP-MW-03)	40 -50	Assess for the presence of PFAS in shallow groundwater downgradient of Gray Field	Gray Field Hangars	Well 17

3 Proposed new well location

1 Proposed existing well sampling location

Approximate groundwater flow direction Sea Level Aquifer, USGS 2005 and 2010

Approximate groundwater flow direction Vashon Aquifer, USGS 2010

Next Steps

- Complete QAPP Addendum (Figures and Tables) for additional well installation and additional existing well sampling, based on results of this meeting
- Prepare for the field work
- Conduct Phase 2 well installation and sampling
- Prepare summary data for TPP #4
  - End of January 2019
- Prepare report

Lakewood Water District Started S

2016 43ppt
6/17 - Sampled 5 wells 47ppt - Scott wells
63ppt - $H_1 + H_2$
38 ppt Scott

Will AFF Segregate within Aquifer, ie NAPL/DNAPL

They have Found that AFFF does segregate by chain length. Shorter chains may move Faster in G.W.

7 HAL in Scott if ~~Sam~~ Adding 5 PFAS WA Health is identifying

Lakewood has shut Down 4 supply wells (Scott's + H_1 + H_2) 20% Reduction in water

Lakewood will need to put treatment systems in place by Spring 2019.

Current Schedule

- October/November 2018 – Additional well installation
- April 2019 – Draft SI Report for Technical Project Team Review
- 30 day review period
- June 2019 – Final SI Report